A

SUMMARY OF CORPORATION FOR PUBLIC BROADCASTING
AUTHORIZATIONS AND APPROPRIATIONS

Fiscal Years 1969-2001 (In Millions of Dollars)

Fiscal Year	CPB Authorization	CPB Appropriation
1969	9	5
1970	25	15
1971	35	23
1972	35	35
1973	45	35
1974	55	47.7
1975	65	62
1976	110	96
1977	103	103
1978	121	119.2
1979	140	120.2
1980	160	152
1981	180	162
1982	200	172
1983	220	137
1984	145	137.5
1985	153	150.5
1986	162	159.5
1987	200.5	200
1988	214	214
1989	238	228
1990	254	229.4
1991	245	242.1
1992	265	251
1993	285	253.35
1994	310	275
1995	375	285.64
1996	425	275
1997		260
1998		250
1999		250
2000		300
2001		340
Total	ttach	5585.09

FUNDING HISTORY OF
PUBLIC TELECOMMUNTICATIONS FACILITIES PROGRAM (PTFP)
(in millions of dollars)

Fiscal Year	Authorization	Appropriation	Funds requested	Number of requests	Number of Radio Awards	Radio Amount
1963-1967		$32	$61	235		
1968		----	----	----		
1969	$12.50	3.2	8	51	11	0.4
1970	15	5.4	5	21	10	0.55
1971	15	11	19.7	96	27	1.67
1972	15	13	11	76	26	1.52
1973	15	13	17.2	84	30	1.9
1974	25	15.7	26.2	121	27	1.72
1975	30	12	18.1	79	21	1.16
1976	30	12.9	18.1	121	30	2.24
1977	30	14	40.1	213	50	1.36
1978	30	18	55.3	254	59	3.88
1979	40	18	84.6	454	51	4.11
1980	40	23.7	79.9	462	50	4.48
1981	40	21.7	103.9	558	59	4.18
1982	20	18	89.1	256	48	3.92
1983	15	15	66.2	327	45	4.14
1984	12	11.9	71.9	324	31	2.1
1985	----	24	124	424	68	4.76
1986	24	22.9	91.3	328	48	3.19
1987	28	20.5	88.7	337	46	3.19
1988	32	21.3	68	304	50	2.91
1989	36	20	58	283	52	4.94
1990	39	20	72.3	297	47	3.45
1991	42	21.8	63.5	277	55	3.8
1992	42	19.9	76	316	54	4.3
1993	42	21.3	77.7	305	42	5.7
1994	42	24	96.9	325	49	3.2
1995		29	75	296	59	5.48
1996		15.5	54.9	251	41	2.7
1997		15.25	49.2	220	37	2.87
1998		21	65.9	240	47	2.5
1999		21	N/A	N/A	N/A	N/A
Total	$711.50	$576	$1,837	7935	1270	$92.32

Source: National Telecommunications and Information Administration, Department of Commerce

C

The FM Receiver Interference Tests, Laboratory Test Report

is contained in a separate loose-leaf notebook, labeled Attachment C.

D

ENGINEERING STATEMENT RE;
MEASURED FM RADIO RECEIVER
AUDIO PERFORMANCE
FCC MM DOCKET 99-25
NATIONAL PUBLIC RADIO
WASHINGTON, D.C.

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FIGURES

Prepared by
Lohnes and Culver Washington, D.C.

July, 1999

ENGINEERING STATEMENT RE;
MEASURED FM RADIO RECEIVER
AUDIO PERFORMANCE
FCC MM DOCKET 99-25
NATIONAL PUBLIC RADIO
WASHINGTON, D.C.

INTRODUCTION

This Engineering Statement has been prepared on behalf of National Public Radio (NPR) Washington, D.C. It supplies information relating to the analysis of the measured audio performance of modern FM Radio receivers, recently conducted by the Consumer Electronics Manufacturers Association (CEMA). It presents observations of the test data and the application of that measured data in FCC Mass Media Docket No. 99-25. The information contained herein is presented in relation to the current FCC Rules, policies and the proposals in the above referenced Docket. The information and exhibits are based on measurements made by CEMA, on behalf of NPR and presented in separate parts of the full NPR and CEMA reports in this Docket, of which this statement is a part.

MEASURED FM RECEIVER PERFORMANCE

A representative sample of FM radio receivers has been tested as explained elsewhere in the NPR and CEMA reports. In summary, the sample consisted of receivers which were generally characterized as follows; five automobile, six personal portable and five home Hi-Fi fixed location receivers. Receiver sales data for recent years, contained elsewhere in the reports, indicates that more than 80 Million FM receivers which fit into these broad categories are sold each year. The sample of test receivers, by these broad categories and by the general receiver design, are thought to represent a significant, if not nearly complete, sample of the FM receivers sold each year.

The receiver samples were carefully tested to determine their individual ultimate performance specifications, to reveal any defective samples and to establish a best case performance baseline. The receivers were then subjected to various tests under simulated use with varying desired and interfering signals presented to each. The test methodology

and assumptions are explained in detail elsewhere in the full CEMA report. By reviewing the test plan and results, the author of this statement is confident that contemporary and credible test methods were employed and that the test provides useful information in the pending Mass Media Rule Making.

The FCC Notice of Proposed Rule Making in the above referenced Docket specifically focused on the performance of receivers in the presence of various potential interfering signals on several nearby frequencies; co-channel, first adjacent, second adjacent and third adjacent. Various desired to interfering signal strengths were considered in these tests. Receiver performance was measured at two target conditions. First, at a desired audio performance level, with the interfering RF level as a variable. Next, the receiver measurements were repeated at various fixed interfering RF signal levels with audio performance as a variable.

GRAPHICAL PRESENTATION OF DATA

A graphical analysis and presentation is made in this report to illustrate the general trend and range of performance of modern FM Radio receivers in the presence of interfering signals. The following graphical information was extracted directly from the detailed CEMA test report. All of the graphs have been confined to the tests conducted with a desired signal power of -50dBm input to the receiver under test. Other tests were conducted at lower input levels but on many of the receivers performance was so bad that meaningful performance measurements could not be made. Test results are plotted with Audio WQP (Weighted Quasi-Peak) SNR (Signal to Noise Ratio) on one axis and the RF desired to undesired (d/u) ratio in dB on the other axis. A negative dB d/u ratio indicates that the desired signal is less than the interfering undesired signal, or conversely that interference exceeds the desired signal.

CO-CHANNEL MEASUREMENT

The graph attached as Figure 1 illustrates all of the data measured for the on frequency (co-channel) interfering signal condition. Three data sets were generated, as explained above, one for the fixed audio performance condition and two for the fixed RF

interfering signal level condition. These three data sets are clearly seen, one clustered about the 45dB Audio WQP SNR horizontal line and two others clustered about the 20 and 30 dB RF d/u Ratio lines. This relation is pointed out here in this moderately clear graph because later graphs with more or less data and more scatter make the depiction less clear.

On each graph several linear trend lines are drawn for some of the receivers. Two receivers are chosen for trend lines from each of the three receiver sample sets; automobile, portable and fixed Hi-Fi. The two lines for each set are drawn for the receivers with the best and worst apparent performance in each test. Hence three sets of upper and lower performance bound lines are drawn on each graph. In the moderately well behaved co-channel test graph this is clearly shown.

The slope of the resulting Audio WQP to RF d/u ratio in this graph is very nearly 1:1, slightly more for the upper left quadrant lines and slightly less for the lower right quadrant lines. The upper left area of each graph represents better overall performance, good audio at poor RF d/u values. The lower right quadrant area represents worse performance. For this test the sample receivers produced the fixed desired 45 dB Audio WQP performance over a relatively wide 17 dB span of d/u ratios, from approximately 34 to 51 dB d/u ratio. Conversely, at the fixed FCC required co-channel RF protection ratio of 20 dB d/u, the audio performance ranged over a similarly wide 14 dB span from approximately 17 to 31 dB WQP SNR. Within each of the three categories of test receivers the variability from best to worst were as follows;

Automobile, approximately 16 dB RF d/u ratio and 12 dB Audio WQP SNR.
Portable, approximately 13 dB RF d/u ratio and 9 dB Audio WQP SNR.
Fixed Hi-Fi, approximately 2 dB RF d/u ratio and 2 dB Audio WQP SNR..

FIRST ADJACENT CHANNEL MEASUREMENTS

The next performance measurements were made with the interfering RF signal on the FM channel first adjacent to the desired channel, one above and one below the desired

channel (+/- 200 kHz). Hence the designation of +/- 1st Adjacent Channel. The measurements were made in two separate groups, on the upper and then the lower channel. They are reported and also graphed in these two groups. In this test some characteristics are reveled, quiet different than those for the co-channel tests. Some of the linear trend lines have the same lower left to upper right slope as seen earlier. However, some are quite steep, nearly vertical, while some are quite shallow, even horizontal or slightly negative slope. The near vertical lines indicate receivers which have a very sudden onset of receiver degradation with increasing interference. The near horizontal lines indicate receivers which have nearly constant audio performance with various RF interference. As a result the variation within the three groups; automobile, mobile and fixed Hi-Fi can not realistically be given a range of variation. With slopes so close to the axis of the graph, some would have nearly zero and some nearly infinite variation.

A second trend now seen on the adjacent channel test graphs, and tabulated in the CEMA test report, is the asymmetry between the upper and the lower adjacent channel tests for some individual receivers. This artifact is most likely due to the asymmetry or mistuning of the receiver RF and IF components.

The sample of all 16 test receivers, on both the upper and lower adjacent channel tests, achieved audio performance at the desired 45 dB WQP SNR ratio with RF interfering signals which varied over a very wide 47 dB range, from good performance at approximately -10 dB d/u to a poor +37 dB d/u. At the fixed FCC d/u ratio of +6dB, the audio performance ranged over the wide range of 41 dB, from approximately 23 dB WQP SNR to approximately 64 dB WQP SNR.

SECOND ADJACENT CHANNEL MEASUREMENTS

The second adjacent tests show a similar range of performance trends, from gently sloping (improving audio performance with diminished RF interference) to nearly flat (good audio performance regardless of interference). The range of performance is widening, but the general limits of performance for the group of receivers can still be listed. For all receivers the 45 dB audio WQP SNR performance ranges over the RF interference d/u ratio range from approximately -57 to approximately +6 dB, a span of 63 dB. At the FCC

specified second adjacent channel d/u ratio of -20 dB, the audio performance ranges over a 59 dB span, from approximately 1dB WQP SNR (near total noise failure) to approximately +60 dB.

A trend, identified earlier, is seen in receiver 3 which reaches 0 dB audio SNR at -20 dB d/u for the upper adjacent channel test but does modestly better for the lower adjacent test. Receiver 16 performs in the opposite, failing earlier on the lower test than on the upper. This is a clear example of the asymmetry mentioned earlier.

A new trend is also evident in some of the receiver performance measurements, some are driven to the point of failure at or near the 0 dB WQP SNR value and stay at 0 dB WQP SNR for all higher interference cases. Receivers 3 and 13 indicate this trend on one or the other of the graphs.

THIRD ADJACENT CHANNEL MEASUREMENTS

The final series of tests covered the third adjacent channel relationships. The trend now is more toward nearly horizontal performance curves, a fixed audio performance is delivered regardless of the interference level for more of the receivers than in earlier graphs. However, several receivers still have sloping performance trends, some at shallow slope angles. Ascribing any range of performance to this test as a whole is impossible since some receivers had good performance regardless of d/u ratio while others had poor performance or failed, even with relatively good d/u ratio.

Clustering by receiver category is now becoming clear. The automobile receivers are all clustered near the top audio performance sections of the graphs. The portable receivers are broadly spread over the lower performance parts of the test range and the fixed home Hi-Fi receivers are clustered moderately tightly in the mid part of the test result graphs. Some still maintain a linear improvement trend verses interference.

CONCLUSIONS

Some broad conclusions can be drawn about modern receiver audio performance

under various conditions of interference.

For co-channel conditions the audio quality of all receivers degrades (or improves) quite quickly and uniformly for a corresponding change in interfering signal level. Indeed there is almost a 1:1 improvement factor where 1 dB less interference means 1dB better audio (within limits of course). However, the ultimate audio performance, defined here at the 45 dB audio WQP SNR ratio still exists over a wide 18 dB range of interference d/u ratios, from about 34 to 52 dB.

At the FCC mandated co-channel d/u ratio of 20 dB, the WQP SNR audio performance of present day stereo receivers is quite poor. It covers a 14 dB range, from 17 dB to 31 dB WQP SNR. This is at least 14 dB and as much as 28 dB below the 45 dB target value. Along the interference axis the d/u value necessary to achieve the 45 dB audio target value ranges from 34 dB to as high as 52 dB. This is from 14 to 32 dB above the FCC mandated co-channel RF protection ratio of 20 dB d/u ratio.

Conventional wisdom has it that FM radio receivers have improved over the years. These tests, however, disclose that, on the whole, they have not. The addition of stereo modulation to the FM system, an addition broadly adopted after the FCC made their allocation separation decisions in the early 1960's, imposes approximately a 26 dB noise penalty. This contemporary "improvement" in FM transmission appears to have completely off-set the FM monaural noise advantage used in the early FCC allocation planning factor tests. The technical FM receiver improvements that may have been made over the intervening years have not made up the difference.

Carrying this analysis to the adjacent channels discloses a similar situation. At the FCC mandated RF d/u ratios the audio performance is not good, particularly for 1st adjacent channels. Most receivers fall below the target 45 dB audio quality target and many fall below even a 30 dB WQP SNR.

Second and third adjacent channel performance is slightly better overall but with the notable exception of the class of portable receivers, including "Walkman" and "Boom-Box" type receivers, the newest and fastest growing category of receiver. Potentially most

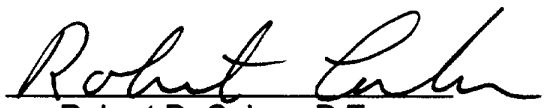
troubling is the trend for some receivers, which may represent a sizable fraction of the present and future receiver population to function very poorly, or to just stop working at all, even at modest RF d/u ratios.

The potential for this rule making to eliminate the second and third adjacent channel protections creates considerable concern for serious interference in the future. Automobile receivers are confined to roadways and, therefore, are limited in their ultimate approach to potential interfering stations. In addition their motion through an area would result in only transient interference, possibly less disrupting than fixed interference. Thus they may, as a class, be less susceptible to all interference. But, automobile receivers are also, as a class, those which are already quite tolerant of second and third adjacent channel interference.

However the personal portable and the fixed Hi-Fi receivers are less tolerant. Also they are used at fixed locations or are slowly carried in portable operation over small areas and hence they, as a group, can not escape from the area of interference created if a second or third adjacent channel station were to locate at or inside an existing service area and near any population area.

In conclusion, the CEMA test data indicates that with the existing and future population of FM receivers, the addition of numerous new potential interfering stations may have a serious detrimental effect on FM broadcast audio and subsidiary communications. The application of very low power, or micro power stations may limit the new interference to very small areas. They may potentially be carefully engineered to control the service where desired and to limit interference to unpopulated areas. Eventually, however, all potential interference must be considered when adopting a plan to add new transmission sources within an existing broadcast band.

Respectfully Submitted,
Lohnes & Culver

by 
Robert D. Culver, P.E.
Md. Reg. No. 19672
July 29, 1999

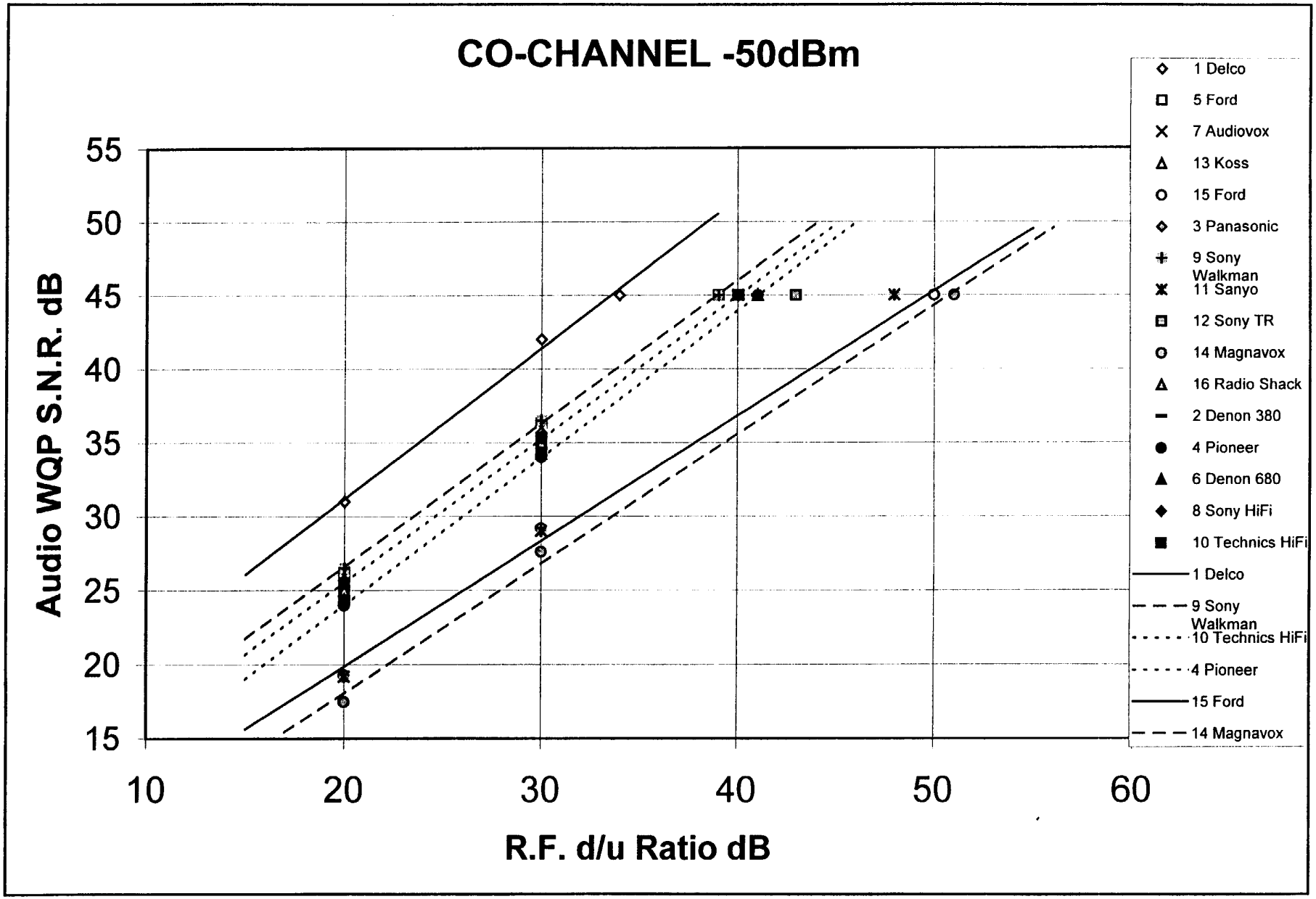

CO-CHANNEL -50dBm
Audio WQP S.N.R. dB
55
50
45
40
35
30
25
20
15
10
20
30
40
50
60
R.F. d/u Ratio dB
1 Delco
5 Ford
7 Audiovox
13 Koss
15 Ford
3 Panasonic
9 Sony Walkman
11 Sanyo
12 Sony TR
14 Magnavox
16 Radio Shack
2 Denon 380
4 Pioneer
6 Denon 680
8 Sony HiFi
10 Technics HiFi
1 Delco
9 Sony Walkman
10 Technics HiFi
4 Pioneer
15 Ford
14 Magnavox

FIGURE 1

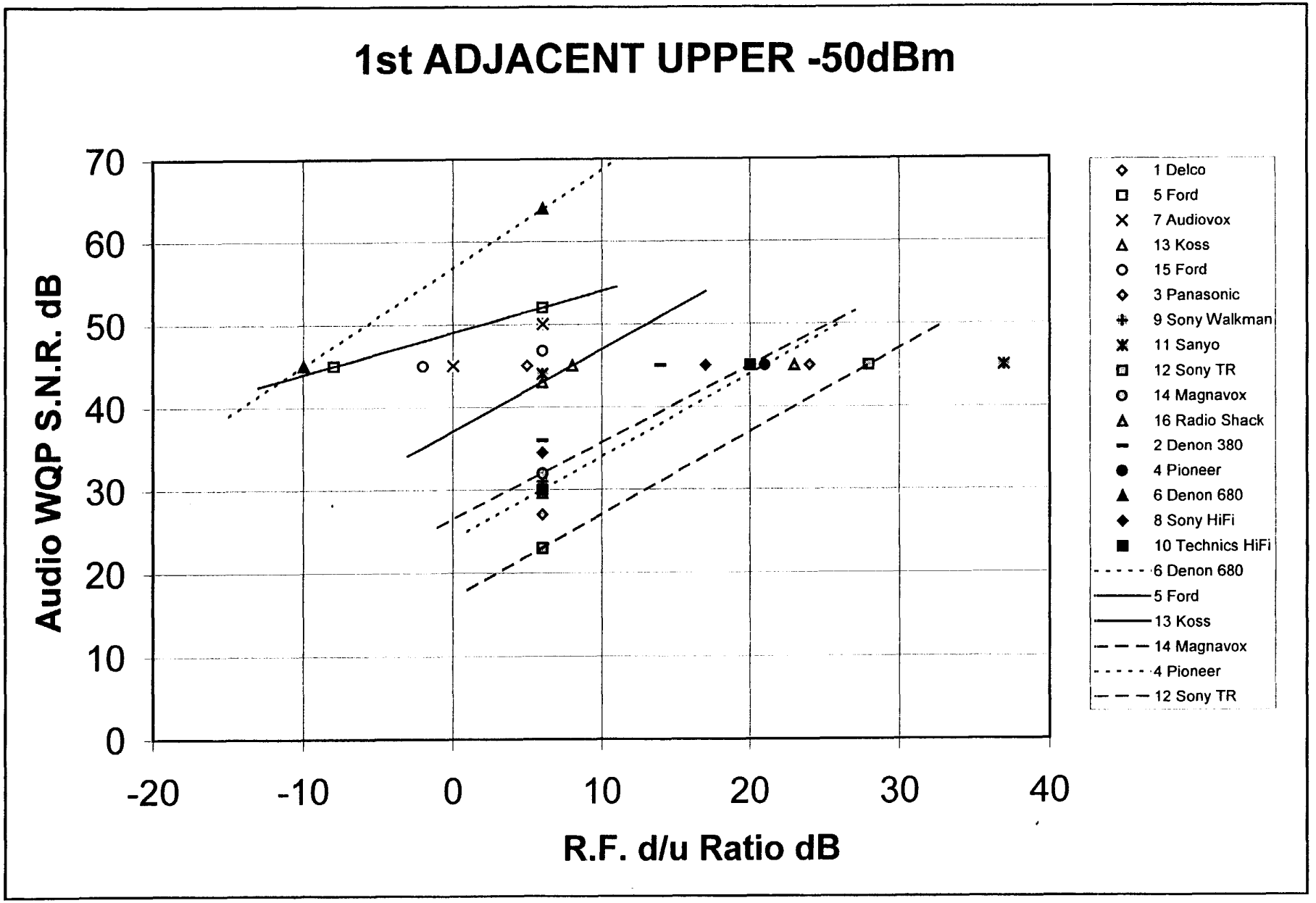

1st ADJACENT UPPER -50dBm
Audio WQP S.N.R. dB
70
60
50
40
30
20
10
0
-20
-10
0
10
20
30
40
R.F. d/u Ratio dB
1 Delco
5 Ford
7 Audiovox
13 Koss
15 Ford
3 Panasonic
9 Sony Walkman
11 Sanyo
12 Sony TR
14 Magnavox
16 Radio Shack
2 Denon 380
4 Pioneer
6 Denon 680
8 Sony HiFi
10 Technics HiFi
6 Denon 680
5 Ford
13 Koss
14 Magnavox
4 Pioneer
12 Sony TR

FIGURE 2A

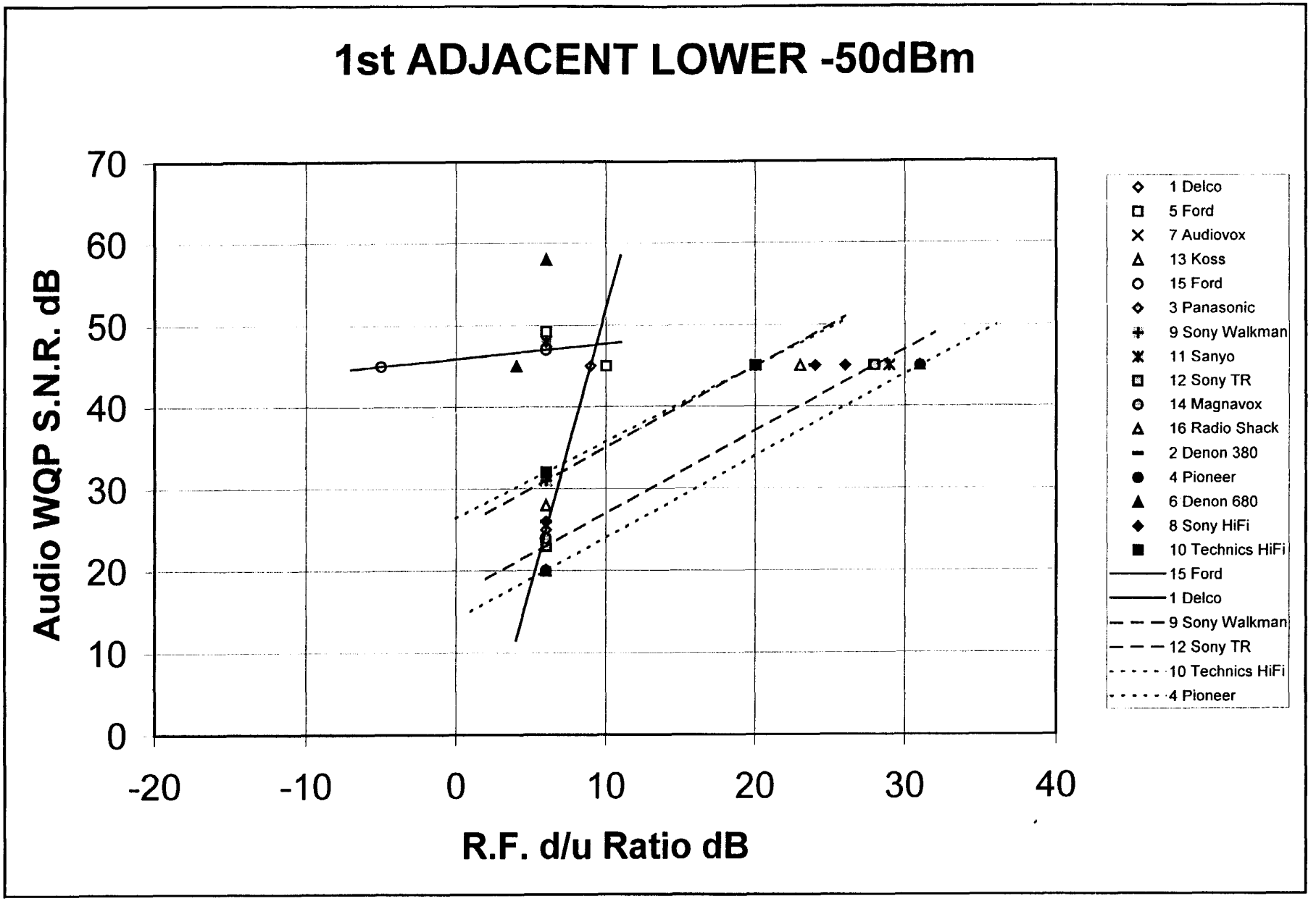

1st ADJACENT LOWER -50dBm
Audio WQP S.N.R. dB
70
60
50
40
30
20
10
0
-20
-10
0
10
20
30
40
R.F. d/u Ratio dB
1 Delco
5 Ford
7 Audiovox
13 Koss
15 Ford
3 Panasonic
9 Sony Walkman
11 Sanyo
12 Sony TR
14 Magnavox
16 Radio Shack
2 Denon 380
4 Pioneer
6 Denon 680
8 Sony HiFi
10 Technics HiFi
15 Ford
1 Delco
9 Sony Walkman
12 Sony TR
10 Technics HiFi
4 Pioneer

FIGURE 2B

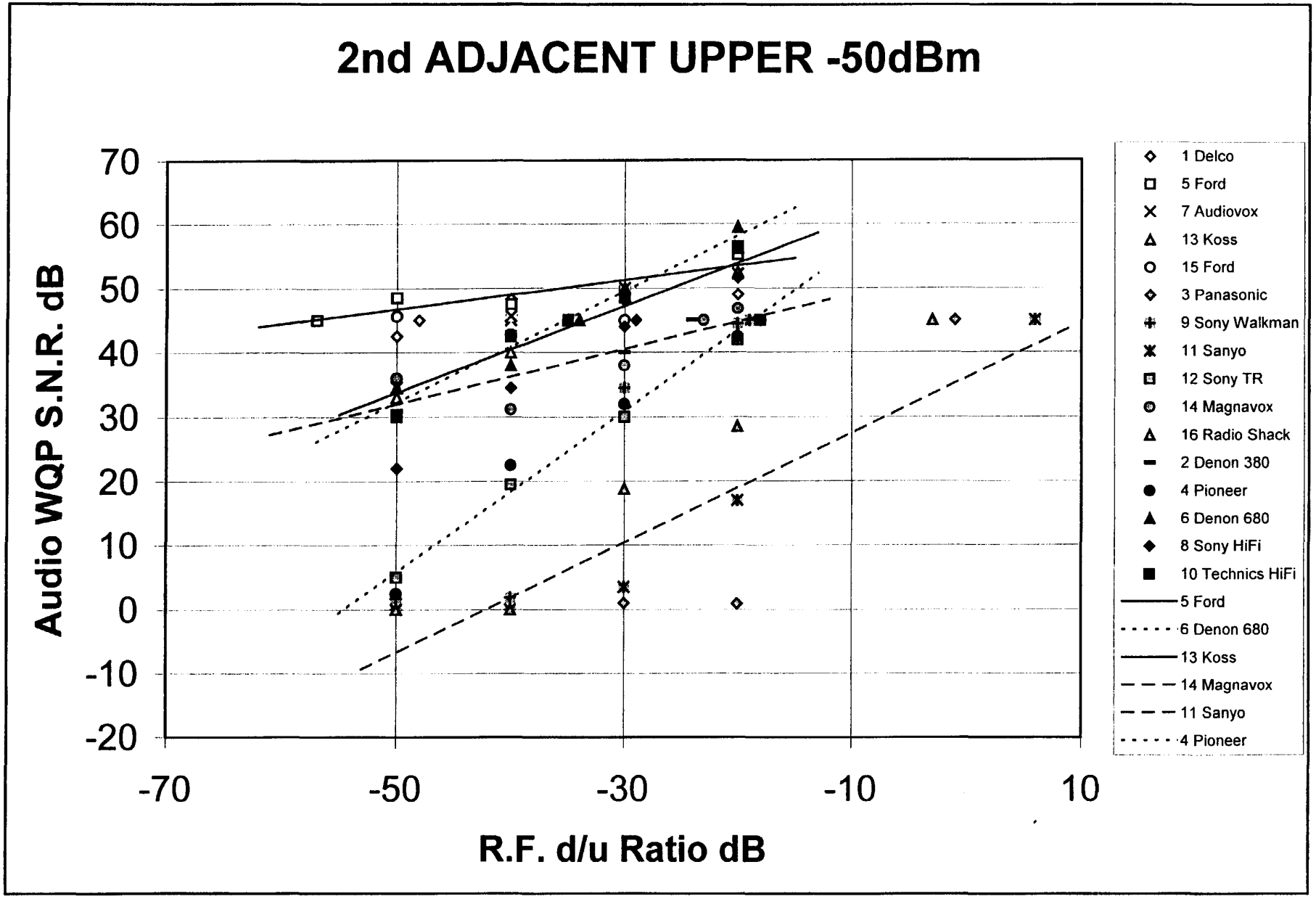

2nd ADJACENT UPPER -50dBm
Audio WQP S.N.R. dB
70
60
50
40
30
20
10
0
-10
-20
-70
-50
-30
-10
10
R.F. d/u Ratio dB
1 Delco
5 Ford
7 Audiovox
13 Koss
15 Ford
3 Panasonic
9 Sony Walkman
11 Sanyo
12 Sony TR
14 Magnavox
16 Radio Shack
2 Denon 380
4 Pioneer
6 Denon 680
8 Sony HiFi
10 Technics HiFi
5 Ford
6 Denon 680
13 Koss
14 Magnavox
11 Sanyo
4 Pioneer

FIGURE 3A

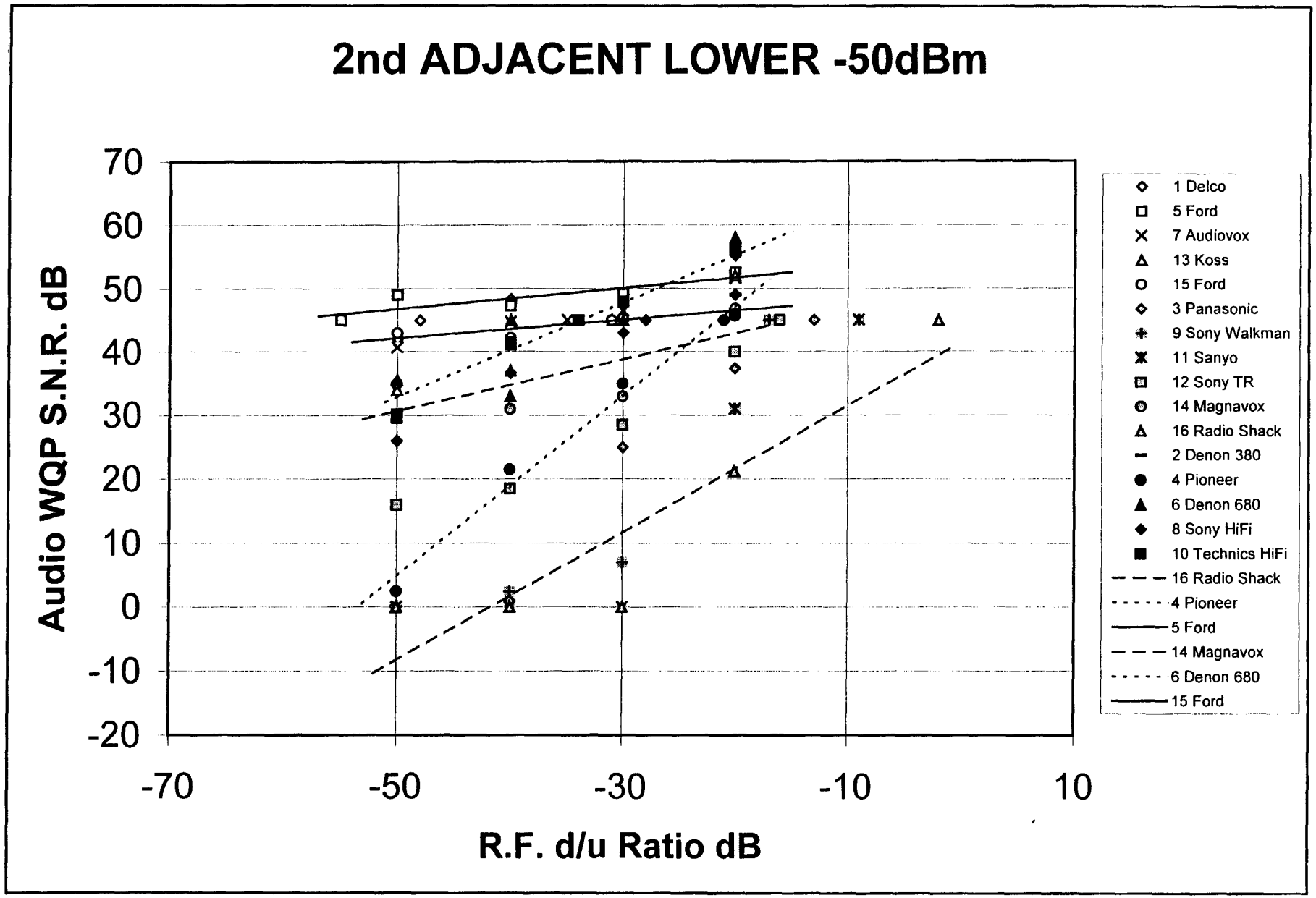

2nd ADJACENT LOWER -50dBm
Audio WQP S.N.R. dB
70
60
50
40
30
20
10
0
-10
-20
-70
-50
-30
-10
10
R.F. d/u Ratio dB
1 Delco
5 Ford
7 Audiovox
13 Koss
15 Ford
3 Panasonic
9 Sony Walkman
11 Sanyo
12 Sony TR
14 Magnavox
16 Radio Shack
2 Denon 380
4 Pioneer
6 Denon 680
8 Sony HiFi
10 Technics HiFi
16 Radio Shack
4 Pioneer
5 Ford
14 Magnavox
6 Denon 680
15 Ford

FIGURE 3E

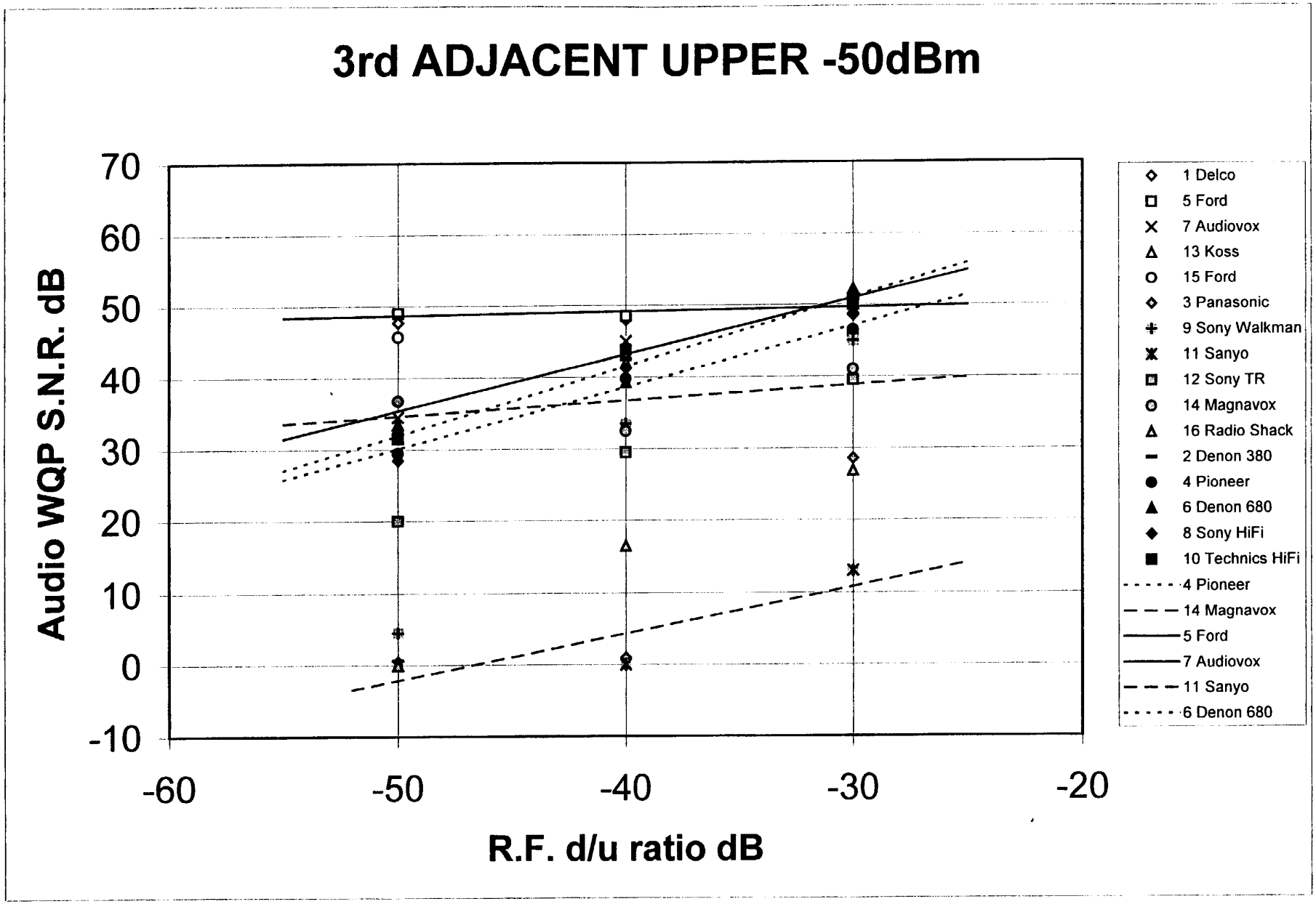

3rd ADJACENT UPPER -50dBm
Audio WQP S.N.R. dB
70
60
50
40
30
20
10
0
-10
-60
-50
-40
-30
-20
R.F. d/u ratio dB
1 Delco
5 Ford
7 Audiovox
13 Koss
15 Ford
3 Panasonic
9 Sony Walkman
11 Sanyo
12 Sony TR
14 Magnavox
16 Radio Shack
2 Denon 380
4 Pioneer
6 Denon 680
8 Sony HiFi
10 Technics HiFi
4 Pioneer
14 Magnavox
5 Ford
7 Audiovox
11 Sanyo
6 Denon 680

FIGURE 4A

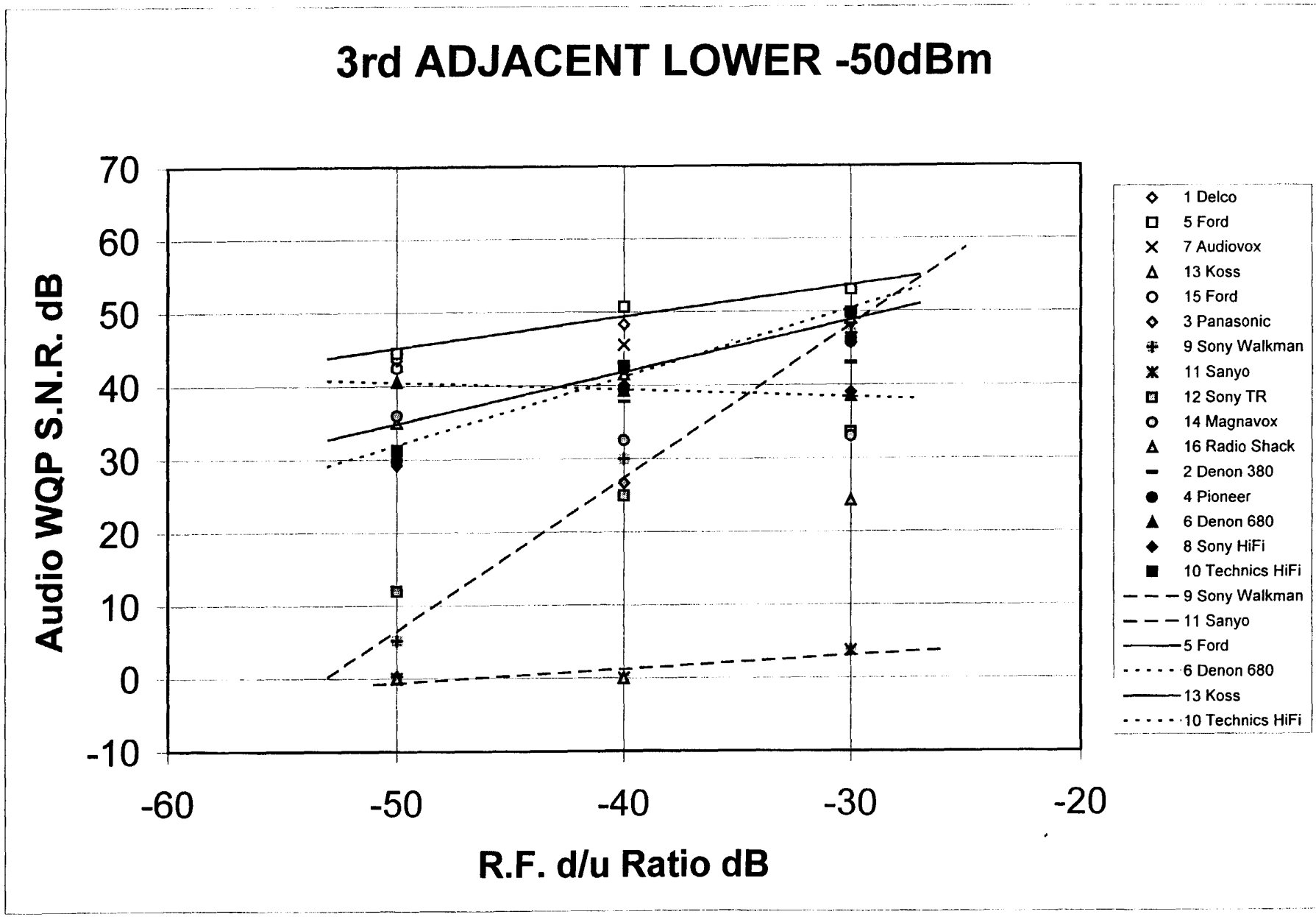

3rd ADJACENT LOWER -50dBm
Audio WQP S.N.R. dB
70
60
50
40
30
20
10
0
-10
-60
-50
-40
-30
-20
R.F. d/u Ratio dB
1 Delco
5 Ford
7 Audiovox
13 Koss
15 Ford
3 Panasonic
9 Sony Walkman
11 Sanyo
12 Sony TR
14 Magnavox
16 Radio Shack
2 Denon 380
4 Pioneer
6 Denon 680
8 Sony HiFi
10 Technics HiFi
9 Sony Walkman
11 Sanyo
5 Ford
6 Denon 680
13 Koss
10 Technics HiFi

FIGURE 4B

E

001

CPB

Corporation for Public Broadcasting
Network Report ALL CPB-SUPPORTED RADIO (w/translators)
1990 Census of Population and Housing

TABLES: A, B, C, D	Station & Translators		Station		Translators	
A PERSONS BY AGE BY SEX						
Universe: Persons						
Total Persons (% base)	221,713,259		219,430,861		9,064,891	
Total Males	107,930,313	49%	106,820,814	49%	4,396,814	49%
Males<1 year old	1,466,885	1%	1,454,675	1%	57,327	1%
Males 1-5 years old	8,571,007	4%	8,482,754	4%	349,847	4%
Males 6-13 years old	12,813,922	6%	12,673,548	6%	522,806	6%
Males 14-17 years old	6,046,341	3%	5,981,645	3%	236,460	3%
Males 18-24 years old	12,029,411	5%	11,905,701	5%	553,108	6%
Males 25-34 years old	19,626,840	9%	19,446,086	9%	787,304	9%
Males 35-54 years old	27,758,000	13%	27,486,797	13%	1,077,967	12%
Males 55-64 years old	9,758,164	4%	9,669,613	4%	343,024	4%
Males 65+ years old	10,858,743	5%	10,717,995	5%	467,971	5%
Total Females	113,782,946	51%	112,610,047	51%	4,667,977	51%
Females<1 year old	1,401,079	1%	1,387,353	1%	57,137	1%
Females 1-5 years old	8,166,467	4%	8,083,526	4%	332,030	4%
Females 6-13 years old	12,203,697	6%	12,068,703	6%	499,815	6%
Females 14-17 years old	5,704,151	3%	5,642,736	3%	225,989	2%
Females 18-24 years old	11,648,487	5%	11,539,684	5%	554,734	6%
Females 25-34 years old	19,691,291	9%	19,511,901	9%	782,687	9%
Females 35-54 years old	28,748,743	13%	28,473,483	13%	1,105,257	12%
Females 55-64 years old	9,844,979	4%	9,733,699	4%	393,761	4%
Females 65+ years old	16,374,052	7%	16,169,962	7%	716,577	8%
B PERSONS BY RACE						
Universe: Persons						
Total Persons (% base)	221,713,259		219,430,861		9,064,891	
White persons	178,732,436	80%	174,712,707	80%	7,485,449	83%
Black persons	27,660,348	12%	27,532,633	13%	944,575	10%
American Indian/Eskimo/Aleut	1,450,147	1%	1,408,501	1%	118,357	1%
Asian/Pacific Islander	6,961,953	3%	6,943,315	3%	182,021	2%
Persons of other races	8,908,375	4%	8,833,605	4%	334,489	4%
C PERSONS BY HISPANIC ORIGIN BY RACE						
Universe: Persons						
Total Persons (% base)	221,713,259		219,430,861		9,064,891	
Persons not of Hispanic origin	201,804,410	91%	199,701,191	91%	8,359,193	92%
Persons of Hispanic origin	19,908,849	9%	19,729,670	9%	705,698	8%
White persons of Hisp origin	10,244,377	5%	10,143,264	5%	351,384	4%
Other persons of Hisp origin	9,664,472	4%	9,586,406	4%	354,314	4%
D PERSONS BY HISPANIC ORIGIN BY AREA OF ORIGIN						
Universe: Persons						
Total Persons (% base)	221,713,259		219,430,861		9,064,891	
Persons not of Hispanic origin	201,804,410	91%	199,701,191	91%	8,359,193	92%
Persons of Hispanic origin	19,908,849	9%	19,729,670	9%	705,698	8%
Persons of Mexican origin	11,764,102	5%	11,648,412	5%	498,952	6%
Persons of Puerto Rican orig	2,554,482	1%	2,537,791	1%	62,003	1%
Persons of Cuban origin	1,033,002	0%	1,028,152	0%	12,720	0%
Persons of other origin	4,557,263	2%	4,515,315	2%	132,023	1%

Corporation for Public Broadcasting
Network Report ALL CPB-SUPPORTED RADIO (w/translators)
1990 Census of Population and Housing

TABLES: E, F	Station & Translators		Station		Translators	
E PERSONS 5-17 YEARS OLD BY LANGUAGE SPOKEN AT HOME BY ABILITY TO SPEAK ENGLISH						
Total persons 5-17 years old	40,049,229		39,613,682		1,620,677	
Speak only English at home	34,335,767	86%	33,941,589	86%	1,445,391	89%
Speak language other than English	5,713,462	14%	5,672,094	14%	175,286	11%
Speak Spanish at home	3,717,888	9%	3,686,213	9%	117,445	7%
Speak English very well or well	3,136,650	8%	3,111,006	8%	100,337	6%
Speak English not well or at all	581,238	1%	577,207	1%	17,108	1%
Speak Asian language at home	795,550	2%	793,116	2%	23,668	1%
Speak English very well or well	662,588	2%	660,481	2%	18,877	1%
Speak Eng not well or at all	132,962	0%	132,637	0%	4,791	0%
Speak other language at home	1,200,024	3%	1,190,763	3%	34,173	2%
Speak English very well or well	1,086,932	3%	1,078,473	3%	30,893	2%
Speak English not well or at all	113,092	0%	112,290	0%	3,280	0%
F PERSONS 18+ YEARS OLD BY LANGUAGE SPOKEN AT HOME BY ABILITY TO SPEAK ENGLISH						
Total persons 18+ years old	165,337,710		163,655,941		6,781,466	
Speak only English at home	141,841,631	86%	140,338,958	86%	6,042,209	89%
Speak language other than English	23,496,079	14%	23,316,983	14%	739,271	11%
Speak Spanish at home	11,985,357	7%	11,882,354	7%	400,559	6%
Speak English very well or well	8,439,062	5%	8,355,859	5%	312,688	5%
Speak English not well or at all	3,546,295	2%	3,526,495	2%	87,871	1%
Speak Asian language at home	3,553,083	2%	3,544,154	2%	94,469	1%
Speak English very well or well	2,642,833	2%	2,635,811	2%	89,955	1%
Speak English not well or at all	910,250	1%	908,343	1%	24,534	0%
Speak other language at home	7,957,639	5%	7,890,475	5%	244,223	4%
Speak English very well or well	7,056,642	4%	6,995,311	4%	220,334	3%
Speak English not well or at all	901,097	1%	895,164	1%	23,889	0%

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TABLES: J, K, L, M	Station & Translators		Station		Translators	
J PERSONS 5 YEARS AND OVER BY LANGUAGE SPOKEN						
Total persons 5 years and over	205,366,939		203,269,623		8,402,157	
Speak only English	176,177,398	86%	174,280,546	86%	7,487,600	89%
Speak Asian language	2,938,870	1%	2,931,926	1%	83,198	1%
Speak Chinese	1,301,678	1%	1,299,739	1%	32,766	0%
Speak Japanese	403,112	0%	401,501	0%	11,746	0%
Speak Mon-Khmer	126,294	0%	126,049	0%	9,071	0%
Speak Korean	612,723	0%	611,453	0%	12,969	0%
Speak Vietnamese	495,063	0%	493,184	0%	16,644	0%
Speak Native North American Language	161,685	0%	151,049	0%	21,293	0%
Speak Spanish or Spanish Creole	16,703,245	8%	15,570,567	8%	518,004	6%
Speak other language	10,405,741	5%	10,335,535	5%	292,064	3%
K PERSONS BY YEAR OF ENTRY						
Universe: Foreign-born persons						
Total persons not born in US	18,813,496		18,739,389		473,148	
Year of entry 1987 - 1990	3,011,919	16%	3,001,863	16%	88,372	18%
Year of entry 1980 - 1986	5,304,961	28%	5,287,518	28%	131,176	28%
Year of entry 1970 - 1979	4,633,046	25%	4,616,191	25%	102,199	22%
Year of entry 1960 - 1969	2,655,643	14%	2,645,508	14%	60,518	13%
Year of entry 1950 - 1959	1,495,884	8%	1,487,774	8%	41,886	9%
Year of entry before 1950	1,711,845	9%	1,700,515	9%	50,997	11%
L PERSONS BY SCHOOL LEVEL						
Universe: Persons 3 years and over						
Total persons (% base)	211,929,239		209,744,288		8,669,132	
Persons not enrolled in school	153,683,060	73%	152,086,628	73%	6,156,353	71%
Persons enrolled in school	58,246,179	27%	57,657,642	27%	2,512,779	29%
Public school	48,770,170	23%	48,251,089	23%	2,154,281	25%
Private school	9,476,009	4%	9,406,573	4%	358,498	4%
Enrolled in preprimary school	4,073,610	2%	4,033,180	2%	164,478	2%
Public school	2,375,863	1%	2,348,943	1%	100,758	1%
Private school	1,697,747	1%	1,684,237	1%	63,720	1%
Enrolled in elementary or high school	37,599,851	18%	37,193,791	18%	1,502,476	17%
Public school	33,686,585	16%	33,308,825	16%	1,382,449	16%
Private school	3,913,066	2%	3,884,966	2%	120,027	1%
Enrolled in college	16,572,918	8%	16,430,671	8%	845,825	10%
Public school	12,707,722	6%	12,593,301	6%	671,074	8%
Private school	3,865,196	2%	3,837,370	2%	174,751	2%
M PERSONS 16-19 YEARS OLD BY SCHOOL ENROLLMEN AND LABOR FORCE STATUS						
Total persons 16 - 19 years old	1472285254		1442241976		31,356,542	
In the armed forces	494,661,965	34%	481,739,628	33%	13,293,945	42%
Civilians	977,623,289	66%	960,502,350	67%	18,062,597	58%
Enrolled in school	974,900,246	66%	957,805,879	66%	17,951,749	57%
Not enrolled in school	2,723,043	0%	2,696,471	0%	110,848	0%
High school graduates	1,318,494	0%	1,304,172	0%	55,734	0%
Employed	921,077	0%	911,330	0%	38,653	0%
Not employed	157,668	0%	155,779	0%	6,667	0%
Not in labor force	239,749	0%	237,063	0%	10,414	0%
Not high school graduates	1,404,549	0%	1,392,299	0%	55,114	0%
Employed	565,812	0%	560,938	0%	22,222	0%
Not employed	241,633	0%	239,348	0%	10,127	0%
Not in labor force	597,104	0%	592,013	0%	22,765	0%

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TABLES: N, O, P, Q	Station & Translators		Station		Translators	
N PERSONS 16+ BY VETERAN STATUS						
Total persons 16+ years old	171,270,914		169,525,981		7,015,209	
In armed forces	1,539,379	1%	1,523,887	1%	43,377	1%
Civilian	169,731,535	99%	168,002,094	99%	6,971,832	99%
Veteran	24,357,098	14%	24,069,255	14%	1,042,013	15%
Non-veteran	145,374,437	85%	143,932,839	85%	5,929,819	85%
O PERSONS 16+ YEARS OLD BY LABOR FORCE STATUS AND OCCUPATION						
Total persons 16+ years old	171,270,914		169,525,981		7,015,209	
In armed forces	1,539,379	1%	1,523,887	1%	43,377	1%
In civilian labor force	111,309,844	65%	110,260,778	65%	4,463,457	64%
Managerial & professional	28,230,476	16%	28,002,608	17%	1,115,248	16%
Technical, sales & administrative support	33,718,549	20%	33,429,954	20%	1,325,163	19%
Service	13,721,460	8%	13,583,990	8%	634,486	9%
Farming, forestry, fishing	2,191,571	1%	2,165,209	1%	89,190	1%
Precision production, craft & repair	11,561,965	7%	11,443,197	7%	424,846	6%
Operators, fabricators & laborers	14,952,667	9%	14,797,041	9%	575,259	8%
Unemployed	6,933,136	4%	6,858,779	4%	299,266	4%
Not in labor force	58,421,691	34%	57,741,316	34%	2,508,376	36%
P PERSONS 16+ YEARS OLD BY LABOR FORCE STATUS AND INDUSTRY						
Total persons 16+ years old	171,270,914		169,525,981		7,015,209	
In armed forces	1,539,379	1%	1,523,887	1%	43,377	1%
In civilian labor force	111,309,844	65%	110,260,778	65%	4,463,457	64%
Agriculture, Forestry, Fishing, Mining	2,942,751	2%	2,887,389	2%	144,085	2%
Construction	6,382,517	4%	6,319,651	4%	239,041	3%
Manufacturing	18,186,440	11%	18,042,813	11%	576,977	8%
Transportation	4,671,551	3%	4,631,915	3%	169,246	2%
Communications and other public utilities	2,809,167	2%	2,780,992	2%	111,224	2%
Wholesale & retail trade	22,258,772	13%	22,032,851	13%	946,252	13%
Finance, insurance & real estate	7,486,716	4%	7,418,275	4%	268,091	4%
Business, repair & personal services	8,484,862	5%	8,409,425	5%	357,738	5%
Entertain & recreation services	1,509,019	1%	1,494,260	1%	71,351	1%
Health & education services	17,512,551	10%	17,337,776	10%	768,188	11%
Public administration	7,126,891	4%	7,071,361	4%	297,602	4%
Other professional & related services	5,024,452	3%	4,976,191	3%	214,398	3%
Unemployed	6,933,136	4%	6,858,779	4%	299,266	4%
Not in labor force	58,421,691	34%	57,741,316	34%	2,508,375	36%
Q WORKERS BY SECTOR Universe: Employed persons 16 years and over						
All workers	104,376,708		103,401,999		4,164,191	
Private for profit wage & salary workers	74,032,151	71%	73,372,914	71%	2,831,719	68%
Private not-for-profit wage & salary workers	7,135,809	7%	7,066,628	7%	310,085	7%
Government workers	15,794,145	15%	15,629,781	15%	711,870	17%
Local government workers	7,427,051	7%	7,349,244	7%	301,567	7%
State government workers	4,763,581	5%	4,707,538	5%	269,663	6%
Federal government workers	3,603,513	3%	3,572,999	3%	140,640	3%
Self-employed workers	6,991,439	7%	6,913,620	7%	285,102	7%
Unpaid family workers	423,364	0%	419,056	0%	15,415	0%

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TABLES: R, S, T, U	Station & Translators		Station		Translators	
R PERSONS 18+ YEARS OLD BY YEARS OF SCHOOL COMPLETED						
Total persons 18+ years old	165,337,710		163,855,941		6,781,480	
Less than 9th grade	14,759,236	9%	14,603,889	9%	516,501	8%
9th to 12th grade, no diploma	24,611,445	15%	24,346,848	15%	961,677	14%
High school (4 years)	49,028,721	30%	48,450,178	30%	1,956,827	29%
Some college, no degree	34,921,208	21%	34,579,037	21%	1,590,118	23%
Associate degree	10,086,069	6%	9,991,383	6%	430,808	6%
Bachelor degree	21,106,196	13%	20,937,711	13%	885,443	13%
Graduate or professional degree	10,824,815	7%	10,746,895	7%	440,306	6%
S HOUSEHOLDS BY INCOME						
Total households	82,109,986		81,240,778		3,495,416	
Income less than $10,000	12,227,008	15%	12,058,137	15%	636,324	18%
Income $10,000 - $19,999	14,093,189	17%	13,802,043	17%	712,724	20%
Income $20,000 - $29,999	13,643,574	17%	13,481,763	17%	629,699	18%
Income $30,000 - $49,999	21,200,530	26%	20,988,558	26%	853,381	24%
Income over $50,000	20,945,685	26%	20,909,677	26%	663,288	19%
T FAMILIES BY FAMILY INCOME						
Total families	57,714,374		57,108,533		2,280,672	
Income less than $10,000	5,286,585	9%	5,217,236	9%	250,099	11%
Income $10,000 - $19,999	8,378,912	15%	8,260,521	14%	397,267	17%
Income $20,000 - $29,999	9,386,926	16%	9,266,254	16%	419,667	18%
Income $30,000 - $49,999	16,587,821	29%	16,410,197	29%	656,717	29%
Income over $50,000	18,075,030	31%	17,954,325	31%	556,912	24%
U NONFAMILY HOUSEHOLDS BY INCOME						
Total unrelated individuals 15+ years old	24,395,766		24,132,398		1,214,744	
Income less than $10,000	7,295,486	30%	7,192,041	30%	404,212	33%
Income $10,000 - $19,999	5,921,785	24%	5,847,177	24%	322,314	27%
Income $20,000 - $29,999	4,277,268	18%	4,236,988	18%	207,685	17%
Income $30,000 - $49,999	4,425,855	18%	4,393,898	18%	186,276	15%
Income over $50,000	2,475,371	10%	2,462,296	10%	94,255	8%

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TABLES: V, W	Station & Translators		Station		Translators	
V HOUSEHOLDS BY RACE OF HOUSEHOLDER BY HOUSE TYPE & PRESENCE OF CHILDREN						
Total households	82,109,986		81,240,778		3,495,416	
Households with white householder	68,173,883	83%	67,384,693	83%	2,989,413	86%
Married couple families	39,651,761	48%	39,196,392	48%	1,582,235	45%
With own children	17,872,721	22%	17,671,209	22%	697,100	20%
Without own children	21,779,040	27%	21,525,183	26%	885,135	25%
Family with male householder, no wife present	1,890,854	2%	1,870,067	2%	78,474	2%
With own children	782,789	1%	782,958	1%	36,651	1%
Without own children	1,098,065	1%	1,087,111	1%	41,823	1%
Family with female householdr, no husband present	6,853,093	7%	5,783,093	7%	264,366	8%
With own children	3,065,380	4%	3,024,316	4%	155,746	4%
Without own children	2,787,713	3%	2,758,777	3%	108,620	3%
Nonfamily households	20,778,175	25%	20,535,141	25%	1,064,338	30%
Households with black householder	9,225,214	11%	9,183,327	11%	325,798	9%
Married couple families	3,237,510	4%	3,222,255	4%	102,779	3%
With own children	1,715,957	2%	1,707,487	2%	56,214	2%
Without own children	1,521,553	2%	1,514,768	2%	48,565	1%
Family with male householder, no wife present	453,919	1%	452,041	1%	15,851	0%
With own children	203,092	0%	202,210	0%	7,197	0%
Without own children	250,827	0%	249,831	0%	8,654	0%
Family with female householdr, no husband present	2,834,959	3%	2,822,423	3%	100,520	3%
With own children	1,774,113	2%	1,765,889	2%	64,277	2%
Without own children	1,060,846	1%	1,056,534	1%	36,243	1%
Nonfamily households	2,698,826	3%	2,686,606	3%	106,648	3%
Households with other race householder	4,710,889	6%	4,672,758	6%	180,205	5%
Married couple families	2,758,115	3%	2,737,550	3%	95,227	3%
With own children	1,845,573	2%	1,830,854	2%	65,347	2%
Without own children	912,542	1%	906,696	1%	29,880	1%
Family with male householder, no wife present	307,967	0%	305,466	0%	11,180	0%
With own children	138,532	0%	134,978	0%	6,084	0%
Without own children	171,435	0%	170,488	0%	5,096	0%
Family with female householdr, no husband present	726,043	1%	719,093	1%	30,040	1%
With own children	474,334	1%	469,267	1%	21,678	1%
Without own children	251,709	0%	249,826	0%	8,362	0%
Nonfamily households	918,764	1%	910,649	1%	43,758	1%
W HOUSEHOLDS BY HISPANIC ORIGIN OF HOUSEHOLDER BY HH TYPE AND PRESENCE OF CHILDREN						
Total households with householder Hispanic origin	5,361,933		5,310,757		197,383	
Married couple families	3,011,144	56%	2,982,170	56%	106,351	54%
With own children	1,977,749	37%	1,958,770	37%	69,695	35%
Without own children	1,033,395	19%	1,023,400	19%	36,656	19%
Family with male householder, no wife present	378,228	7%	375,211	7%	12,737	6%
With own children	181,850	3%	180,182	3%	6,862	3%
Without own children	196,378	4%	195,029	4%	5,875	3%
Family with female householdr, no husband present	955,205	18%	946,440	18%	34,131	17%
With own children	633,616	12%	627,467	12%	24,159	12%
Without own children	321,589	6%	318,973	6%	9,972	5%
Nonfamily households	1,017,356	19%	1,006,936	19%	44,164	22%

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TABLES: X, Y, Z, AA	Station & Translators		Station		Translators	
X CHILDREN BY AGE BY HOUSEHOLD TYPE Universe: Own children under 18 years						
Total children under 18 years	51,101,990		50,546,537		2,086,450	
Children under 3 years	8,542,197	17%	8,454,430	17%	350,501	17%
In married couple family	7,003,136	14%	6,932,650	14%	273,760	13%
In family with male householder, no wife	314,930	1%	311,204	1%	14,849	1%
In family with female householder, no husband	1,224,131	2%	1,210,576	2%	62,092	3%
Children 3-5 years	8,874,377	17%	8,780,069	17%	367,400	18%
In married couple family	7,052,372	14%	6,977,926	14%	280,107	13%
In family with male householder, no wife	282,684	1%	279,334	1%	13,040	1%
In family with female householder, no husband	1,539,321	3%	1,522,809	3%	74,253	4%
Children under 6-11 years	17,567,502	34%	17,370,693	34%	728,304	35%
In married couple family	13,672,063	27%	13,516,543	27%	549,323	26%
In family with male householder, no wife	563,700	1%	557,537	1%	25,109	1%
In family with female householder, no husband	3,331,739	7%	3,296,613	7%	151,879	7%
Children under 12-14 years	8,205,560	16%	8,113,515	16%	333,504	16%
In married couple family	6,266,248	12%	6,194,331	12%	249,060	12%
In family with male householder, no wife	288,617	1%	285,483	1%	12,448	1%
In family with female householder, no husband	1,650,695	3%	1,633,701	3%	71,996	3%
Children under 15-17 years	7,912,354	15%	7,827,830	15%	306,741	15%
In married couple family	5,965,200	12%	5,899,649	12%	227,261	11%
In family with male householder, no wife	313,417	1%	310,179	1%	12,868	1%
In family with female householder, no husband	1,633,737	3%	1,616,002	3%	66,612	3%
Y PERSONS WITH INCOME BELOW POVERTY LEVEL, BY AGE Universe: Persons for whom poverty status is determined						
Total persons below poverty level	27,341,838		27,005,598		1,343,252	
Under 6 years old	3,758,978	14%	3,711,665	14%	186,782	14%
6-11 years old	3,318,984	12%	3,277,341	12%	153,628	11%
12-17 years old	2,742,275	10%	2,709,067	10%	119,278	9%
18 years old and over	17,521,601	64%	17,307,525	64%	883,563	66%
Z CHILDREN BELOW POVERTY LEVEL BY HOUSEHOLD TYPE Universe: Related children under 18 years						
Total children below poverty level	9,586,121		9,466,968		447,282	
Under 6 years old	3,758,978	39%	3,711,665	39%	186,782	42%
In married couple family	1,422,933	15%	1,402,927	15%	69,339	16%
In family with male householder, no wife	200,678	2%	198,041	2%	10,016	2%
In family with female householder, no husband	2,135,367	22%	2,110,697	22%	107,427	24%
6-17 years old	5,827,143	61%	5,755,323	61%	260,500	58%
In married couple family	2,191,191	23%	2,161,130	23%	93,906	21%
In family with male householder, no wife	280,923	3%	277,590	3%	13,249	3%
In family with female householder, no husband	3,355,029	35%	3,316,613	35%	153,345	34%
AA HOUSEHOLDS BELOW POVERTY LEVEL BY HOUSEHOLD TYPE						
All households below poverty level	10,058,516		9,927,212		521,132	
In married couple family	2,318,618	23%	2,286,317	23%	102,935	20%
In family with male householder, no wife	351,409	3%	347,228	3%	16,689	3%
In family with female householder, no husband	2,862,326	28%	2,828,318	28%	138,108	27%
Householder living alone	3,731,359	37%	3,679,974	37%	198,566	38%
Householder not living alone	794,606	8%	785,375	8%	64,934	12%

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TABLES: BB, CC	Station & Translators		Station		Translators	
BB HOUSING UNITS IN URBANIZED AND RURAL AREAS						
Total housing units	99,300,186		89,276,714		3,947,412	
Inside urbanized area	62,262,402	69%	61,924,427	69%	2,317,325	59%
Outside urbanized area	9,150,453	10%	8,735,961	10%	1,017,788	26%
Rural	18,887,331	21%	18,616,326	21%	612,299	16%
Farm	1,023,051	1%	1,016,548	1%	17,713	0%
Non-farm	17,864,280	20%	17,599,778	20%	594,586	15%
CC PERSONS IN URBANIZED AND RURAL AREAS						
Total persons	221,713,259		219,430,861		9,064,691	
Inside urbanized area	153,560,261	69%	152,742,162	70%	5,398,127	60%
Outside urbanized area	22,171,427	10%	21,269,877	10%	2,319,476	26%
Rural	45,981,571	21%	45,418,822	21%	1,347,288	15%
Farm	2,852,459	1%	2,834,826	1%	48,681	1%
Non-farm	43,129,112	19%	42,583,996	19%	1,298,607	14%